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**2015 Immune Risk  
Standing Review Panel  
Status Review**

**Status Review for:**

*The Risk of Adverse Health Event Due to Altered Immune Response*

**Comments to the Human Research Program, Chief Scientist**

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2015 Immune Risk Standing Review Panel (SRP) Status Review WebEx/teleconference  
Participants:

**SRP Members:**

Gailen Marshall, M.D., Ph.D. (chair) – University of Mississippi Medical Center  
Sandeep Agarwal, M.D., Ph.D. – Baylor College of Medicine  
Nancy Klimas, M.D. – Nova Southeastern University  
Pablo Okhuysen, M.D. – MD Anderson Cancer Center

**NASA Johnson Space Center (JSC):**

Brian Crucian, Ph.D.  
Jennifer Fogarty, Ph.D.  
Kerry George  
Hawley Kunz  
Peter Norsk, M.D.  
Michele Perchonok, Ph.D.  
Stephanne Ploeger  
Gary Riccio, Ph.D.  
Susan Steinberg, Ph.D.

**NASA Headquarters (HQ):**

Stephen Davison, Ph.D.  
Bruce Hather, Ph.D.

**National Space Biomedical Research Institute (NSBRI):**

Dorit Donoviel, Ph.D.

**NASA Research and Education Support Services (NRESS):**

Tiffin Ross-Shepard

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On November 13, 2015, the Immune Risk SRP, participants from the JSC, HQ, the NSBRI, and NRESS participated in a WebEx/teleconference. The purpose of the call (as stated in the Statement of Task) was to allow the SRP members to:

1. Receive an update from the Human Research Program (HRP) Chief Scientist (or designee) on the status of NASA's current and future exploration plans and the impact these will have on the HRP.
2. Receive an update on any changes within the HRP since the 2014 SRP meeting.
3. Receive an update by the Element or Project Scientist(s) since the 2014 SRP meeting.
4. Participate in a discussion with the HRP Chief Scientist (or designee) and the Element regarding possible topics to be addressed at the next SRP meeting.

Based on the presentations and the discussion during the WebEx/teleconference, the SRP would like to relay the following information to Dr. Shelhamer, the HRP Chief Scientist.

1. The SRP thought the WebEx/teleconference was very informative and appreciated the presentations from Dr. Perchonok, Dr. Norsk and Dr. Crucian.
2. It is the SRPs understanding that the HRP management recognizes and supports the need for integrated projects that involve work under the aegis of various SRPs. From what the SRP has been told, there have been multiple meetings that bring representatives from the various SRPs to advise on development of interdisciplinary research directions. Given that we firmly believe that immunology and optimized inflammation mechanisms are at the core of astronaut health, we are concerned that, to date, the Immune Risk SRP has not participated in any of these interdisciplinary SRP meetings. While we were told during our meeting about several ongoing and planned interdisciplinary projects that involve the JSC immunology team(s), it is a concern to us that our input seems a posteriori regarding integrated research directions.
3. There is concern about the lack of uniformity in the design and implementation of more standardized assay methodology to characterize the astronaut immune responses before, during and after spaceflight. The collaborative studies presented, as well as other proposed ancillary studies use methodology that is distinct enough to warrant questions about comparing the data. For example, there are immune studies that use either whole blood or semi purified peripheral blood mononuclear cells. Dr. Crucian presented lucid and compelling arguments of why one versus the other sample is preferred. Yet the collaborative studies described continue to use both cell sources which are NOT directly comparable. To respect research colleagues who have developed their own assay conditions for their own laboratories is certainly understandable from a science ethics point of view. Yet, given the highly limited and precious nature of the astronaut samples that are being obtained and the statistical suppositions that have to be made with such small sample sizes, it is critical that further variation from methodological differences be minimized. Given that the JSC Immunology team lead by Dr. Crucian is the custodian of these samples, his group should dictate the samples that will be used and the assays that will be performed in as identical assay settings as possible. This is not to criticize the capabilities or expertise of others – it is to say that inter assay accuracy and inter

laboratory precision do not translate across different methodologies or different laboratories.

4. Again, the SRP is concerned about data analysis methodology and continues to urge for collaboration with systems biologists who have expertise in immunology to better characterize the immune risks of spaceflight.
5. Lastly, in future meetings, the SRP would like the presentations to clearly show what integration is currently going on with other HRP groups instead of having to ask for that information.